Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Cancel Claims 33-72.

33. - 72. (canceled)

Add new claims 73-100.

73. (new) A micromechanical resonator device having at least one mode shape, the device comprising:

a substrate;

a resonator disposed above the substrate and having a disk-shaped surface wherein the at least one mode shape involves axial, flexural or contour modification of the disk-shaped surface at resonance; and

a support structure anchored to the substrate to support the resonator above the substrate wherein both the resonator and the support structure are dimensioned and positioned relative to one another so that the resonator is substantially isolated during vibration thereof wherein energy losses to the substrate are substantially eliminated and wherein the resonator device is a high-Q resonator device.

74. (new) A micromechanical resonator device having at least one mode shape, the device comprising:

a substrate;

a resonator disposed above the substrate and having a disk-shaped surface wherein the at least one mode shape involves axial, flexural or contour modification of the disk-shaped surface at resonance; and

a drive electrode structure formed on the substrate at a position to allow electrostatic excitation of the resonator so that the resonator is driven in the at least one mode

shape wherein the resonator and the drive electrode structure define a capacitive gap therebetween and wherein the capacitive gap is a sub-micron, lateral, capacitive gap.

75. (new) A micromechanical resonator device having at least one mode shape, the device comprising:

a substrate;

a resonator disposed above the substrate and having at least one nodal point;

a disk-shaped surface wherein the at least one mode shape involves axial, flexural or contour modification of the disk-shaped surface at resonance wherein the at least one nodal point corresponds to a center of the resonator; and

a support structure to support the resonator wherein the support structure is a single anchor positioned at the center of the resonator.

76. (new) A micromechanical resonator device having at least one mode shape, the device comprising:

a substrate;

a resonator disposed above the substrate and having a disk-shaped surface wherein the at least one mode shape involves axial, flexural or contour modification of the disk-shaped surface at resonance; and

a drive electrode structure formed on the substrate at a position to allow electrostatic excitation of the resonator so that the resonator is driven in the at least one mode shape wherein the resonator and the drive electrode structure define a capacitive gap therebetween and wherein the drive electrode structure is positioned beneath the resonator and wherein the at least one mode shape includes a flexural mode shape.

77. (new) A micromechanical resonator device having at least one mode shape, the device comprising:

a substrate; and

a resonator disposed above the substrate and having a disk-shaped surface wherein the at least one mode shape involves axial, flexural or contour modification of the disk-shaped surface at resonance and wherein the device is diamond-based.

78. (new) The device as claimed in claim 77, further comprising a support structure anchored to the substrate to support the resonator above the substrate wherein both the resonator and the support structure are dimensioned and positioned relative to one another so that the resonator is substantially isolated during vibration thereof wherein energy losses to the substrate are substantially eliminated and wherein the resonator device is a high-Q resonator device.

79. (new) The device as claimed in claim 77, wherein the at least one mode shape includes a radial-contour mode shape.

80. (new) The device as claimed in claim 77, wherein the at least one mode shape includes a flexural mode shape.

81. (new) The device as claimed in claim 77, further comprising a drive electrode structure formed on the substrate at a position to allow electrostatic excitation of the resonator so that the resonator is driven in the at least one mode shape and wherein the resonator and the drive electrode structure define a capacitive gap therebetween.

82. (new) The device as claimed in claim 81, wherein the drive electrode structure is disposed about a periphery of the resonator and wherein the at least one mode shape includes a radial-contour mode shape.

83. (new) The device as claimed in claim 82, wherein the drive electrode structure includes a plurality of split electrodes.

84. (new) The device as claimed in claim 81, further comprising a sense electrode structure formed on the substrate at a position to sense output current based on motion of the resonator.

85. (new) The device as claimed in claim 84, wherein the drive electrode structure includes a plurality of separate input drive electrodes and the sense electrode structure includes a plurality of separate output sense electrodes.

86. (new) A micromechanical device comprising:

a substrate;

an input resonator disposed above the substrate and having at least one mode shape and a disk-shaped surface;

an output resonator disposed above the substrate and coupled to the input resonator and having at least one mode shape and a disk-shaped surface wherein the at least one mode shape of at least one of the resonators involves axial, flexural or contour modification of the disk-shaped surface at resonance; and

a coupling spring for mechanically coupling the resonators together.

87. (new) A micromechanical device comprising:

a substrate;

an input resonator disposed above the substrate and having at least one mode shape and a disk-shaped surface;

an output resonator disposed above the substrate and coupled to the input resonator and having at least one mode shape and a disk-shaped surface wherein the at least one mode shape of at least one of the resonators involves axial, flexural or contour modification of the disk-shaped surface at resonance;

an intermediate resonator disposed above the substrate and coupled to the input and output resonators and having at least one mode shape;

a drive electrode structure formed on the substrate at a position to allow electrostatic excitation of the input resonator;

a sense electrode structure formed on the substrate at a position to sense output current based on motion of the output resonator; and

an intermediate electrode structure formed on the substrate at a position for enhanced access to a response of the device.

88. (new) A micromechanical device comprising:

a substrate;

an input resonator disposed above the substrate and having at least one mode shape and a disk-shaped surface; and

an output resonator disposed above the substrate and coupled to the input resonator and having at least one mode shape and a disk-shaped surface wherein the at least one mode shape of at least one of the resonators involves axial, flexural or contour modification of the disk-shaped surface at resonance and wherein the device is a mixer.

89. (new) A micromechanical resonator device having at least one mode shape, the device comprising:

a substrate;

a resonator disposed above the substrate and having a disk-shaped surface wherein the at least one mode shape involves axial, flexural or contour modification of the disk-shaped surface at resonance, the resonator having at least one anti-nodal portion where the resonator experiences the most displacement when driven;

sensing means for sensing motion of the anti-nodal portion to move therewith; and

means coupled to the at least one projection to provide an output representation of motion of the anti-nodal portion.

90. (new) The device as claimed in claim 89, wherein the means includes at least one electrode structure.

91. (new) A micromechanical resonator device having at least one mode shape, the device comprising:

a substrate;

a resonator disposed above the substrate and having at least one mode shape and a disk-shaped surface wherein the at least one mode shape involves axial, flexural or contour modification of the disk-shaped surface at resonance; and

a single electrode structure formed on the substrate at a position to allow electrostatic excitation of the resonator and to sense output current based on motion of the resonator.

92. (new) The device as claimed in claim 86, further comprising support structures anchored to the substrate to support the input and output resonators above the substrate.

93. (new) The device as claimed in claim 86, wherein the micromechanical device is a filter.

94. (new) The device as claimed in claim 86, wherein the device is a bandpass filter.

95. (new) The device as claimed in claim 86, further comprising a drive electrode structure formed on the substrate at a position to allow electrostatic excitation of the input resonator and a sense electrode structure formed on the substrate at a position to sense output current based on motion of the output resonator.

96. (new) The device as claimed in claim 73, wherein the resonator is supported above the substrate at one or more discrete locations on the resonator.

97. (new) The device as claimed in claim 73, wherein the support structure includes an anchor that supports the resonator above the substrate.

98. (new) The device as claimed in claim 97, wherein the support structure includes a further anchor.

99. (new) The device as claimed in claim 97, wherein the resonator is center-anchored to the substrate by the anchor.

100. (new) A micromechanical resonator device having at least one mode shape, the device comprising:

a substrate; and

a resonator disposed above the substrate and having a disk-shaped surface wherein the at least one mode shape includes a wine-glass mode that involves modification of the disk-shaped surface at resonance.

Amendments to the Drawings:

The attached sheet of drawings includes changes to Figs. 5 and 6. This sheet, which includes Figs. 5 and 6, replaces the original sheet including Figs. 5 and 6.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes